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WORLD MARITIME UNIVERSITY

Malmö, Sweden

**MARITIME CASUALTY INVESTIGATION IN
JORDAN**

Current implementation of IMO standards and future development

By

Enas Nadi H. Al-Mahariq

The Hashemite Kingdom of Jordan

A dissertation submitted to the World Maritime University in partial fulfilment of
the requirement for the award of the degree of

MASTER OF SCIENCE

In

MARITIME AFFAIRS

(MARITIME LAW AND POLICY)

2019

Dissertation Declaration

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature):
(Date): 24 Sep. 2019

Supervised by: **Professor Laura Carballo Piñeiro**

Supervisor's affiliation **Maritime Law and Policy**

World Maritime University

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Abstract

Title of Dissertation: **Maritime casualty investigation in Jordan; current implementation of IMO standards and future development**

Degree: **Master of Science**

This study aims to identify the extent of the current implementation of the Maritime Casualty Investigation Code in Jordan and future development. Therefore, to study this topic, several questions were put forward to focus on the objective of this study. A legal and descriptive approach is used to answer the study questions; a descriptive and legal approach was used by reviewing IMO legal instruments and Jordan legislation with respect to marine Casualty Investigation Code. Various previous studies and articles highlight other States differ in the way they implement their international obligations in relation to the provisions of the Casualty Investigation Code. Moreover, an analysis was made using the SWOT tool to identify the gaps between the current implementation and the expected implementation as a standard measures obligation. The results indicate inadequacies in the current implementation of international and national casualty investigation legislation in Jordan. Despite, the extensive efforts made by Jordan to ratify all the international instruments in respect to marine casualty investigation.

Keywords: Casualty Investigation Code, Marine Safety Investigation, Current implementation, Investigation Methodologies, Marine casualty process, Future development, Investigation report.

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List of Abbreviations

ASEZ	Aqaba Special Economic Zone
IMO	International Maritime Organization
IMCO	Inter-Governmental Maritime Consultative Organization
JMC	Jordan Maritime Commission
MOT	Ministry of Transport in Jordan
WMU	World Maritime University
US	United States
NTSB	National Transportation Safety Board
RMI	Republic of the Marshall Island
VDR	Voyage Data Recorder
EU	European Union
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea 1982
SOLAS	International Convention for the Safety of Life at Sea 1974
MARPOL	International Convention for the Prevention of Pollution from Ships 1973
LL	International Convention on Load Lines 1966
ILO	International Labour Organization
MLC	Maritime Labour Convention 2006
ADC	Aqaba Development Corporation
ACPOM	Aqaba Company for Ports Operation and Management
MaRCAT	Marine Root Cause Analysis Technique
ABS	American Bureau of Shipping

IMGW	Institute of Meteorology and Water Management
ISO	International Standardization Organization
GISIS	Global Integrated Shipping Information System
ICAO	The International Civil Aviation Organization
SHK	Swedish Board of Accident Investigation
CSB	Civil Service Bureau
EMSA	European Maritime Safety Agency
KNKT	Komite Nasional Keselamatan Transportasi
IMSAS	IMO Member State Audit Scheme
III Code	IMO Instruments Implementation Code

1. Chapter One Introduction

1.1 Background

Aqaba is a city located in the southern part of the Hashemite Kingdom of Jordan, which is about 330 kilometers from the capital Amman to the south. In 2001, it was transformed into the Aqaba Special Economic Zone (ASEZ) becoming central access, with three continents Africa, the Middle East and West Asia intersecting and establishing a global axis for investors and tourists alike (ASEZA, 2017). The region extends to the borders of Israel, Saudi Arabia and Egypt's territorial waters and lies on the Gulf of Aqaba, which flows into the Red Sea (Gladstone, Facey, & Hariri, 2006). It forms a strategic entrance for regional and international markets. The age of the port of Aqaba is linked to the age of the city itself, which dates back to the thirteenth century BC (ASEZA, 2017).

The Gulf of Aqaba is the link between the Far East, India and the Middle East without the need to go through the Suez Canal, which is located on latitude (29.31) north and longitude (35.01) east in the Gulf of Aqaba. Moreover, the only port access to Jordan has great economic importance due to its commercial, industrial and tourist activities (Aqaba Port, 2019).

The port of Aqaba one of the most important elements in the maritime transport activities and a major center for Jordanian maritime trade activity. The port of Aqaba has a prominent role in the development of the Jordanian economy and to the transiting cargo of neighboring countries and this is evident through the active trade movement carried out in the port system (Ministry of Transport, 2017)

The Gulf of Aqaba is a commercially active area, including the transport of passengers and goods by sea. Thus, it is vulnerable to maritime casualties, which could threaten the safety of life and the marine environment. Therefore, it is necessary for experts to conduct a marine casualty investigation and identify the causes and factors of the casualty through investigating the technical, legal, and administrative aspects in the ship (JMC, 2019).

The International Maritime Organization (IMO) was formally established in 1948, through an international conference in Geneva under the name Inter-Governmental Maritime Consultative Organization (IMCO) to deal with shipping matters (IMO, 2019). IMO as an international organization has developed many international instruments such as conventions, protocols as international legislative provisions and international controls, and resolutions as a non-binding way to help the member States to achieve the requirements of saving lives, and protecting the marine environment (IMO, 2019).

IMO is a regulatory body for one hundred and seventy-four member States that have their sovereignty and have ratified the international instruments with common high standards for all these member States (Amin, McDevitt, & Gibbs, 2018). The rapid increase in the volume of maritime trade in Jordan is putting an enormous obligations on Jordan to ensure safety in the Jordanian territorial waters and ships that fly the Jordanian flag wherever they exist (JMC, 2019).

1.2 Research Questions

This study will highlight marine casualty investigation in Jordan, including the current implementation of IMO standards. Moreover, it will try to find opportunities for improvement and development by going through national legislation. In addition, it will define the gap between the implementation and the best practice to fulfil the maritime administration's obligations in Jordan with respect to the Casualty Investigation Code.

By focusing on the objectives, the key research questions are:

- What is the state of the art in Jordan as regards the IMO Casualty Investigation Code's implementation and application?
- What are the practical challenges before and after the IMO Member State Audit Scheme (IMSAS) audit to identify the key areas for improvement?
- What are the pathways to fix the current status of such regulations in Jordan and meet the obligations of the Casualty Investigation Code?

1.3 Objectives and Aims

The essential goal of this research is to provide a wider perspective of the deficiencies faced in the current implementation of IMO legislation on casualty investigation and then identify the potential for development in Jordan.

The objectives of the study are as follow:

- To analyze and evaluate the current practice of the Casualty Investigation Code and the national policy in Jordan;
- To identify the practical challenges before and after IMSAS audit to identify the key areas for improvement;
- To highlight the gap through an analysis of the current status in Jordan and what should be applied to meet its obligation as a Member State for “future development”.

1.4 Methodology

This study utilizes the legal-normative approach while going through the primary resources of all relevant legal instruments. Such as conventions, codes, resolutions and publications of IMO in respect to marine casualty investigation. In addition, the national law, regulations that imposed to implement the marine casualty investigation in Jordan. Moreover, the study refers to secondary resources of data analysis. A large volume of sources of available data from public documents and official records, annual reports from JMC and all their maritime stakeholders. Primary and secondary sources of data from pertinent reports, articles, official websites, and books were utilized to highlight the challenges that faced by Jordan and other factors that influenced the current implementation of IMO legislation in Jordan's maritime administration in casualty investigation.

Hence, the critical analysis and the results will be used to find the gaps, link the regulations in Jordan to the corresponding IMO legislations. The SWOT analysis tool and descriptive analysis are applied to look at different factors. In addition, interviews are the guiding methods used in this study.

Overall, any research involves ethical issues, and this research studies confidential reports and documents. Therefore, the ethical issues will be dealt with as per the regulations of World Maritime University (WMU) and the concerned authorities.

1.5 Dissertation Structure

In order to achieve the main aim of this dissertation, the research consists of the following six chapters (see Figure 1):

Chapter one will cover the comprehensive background of the research and present the problems related to the chosen topic. These research questions seek to

identify the gaps between the current status of casualty investigation in Jordan and optimal implementation of the international instruments dealing with the topic.

Chapter two will highlight the interaction between the international instruments that contain the legal framework for maritime casualty investigations, and the legal and institutional framework of Jordan as a sovereign country.

Chapter three employs different sources for different States in terms of how they set out the marine casualty investigation concepts, process and models into their national legislations. This will help to know if Jordan legislation reflects a better understanding of the marine casualty investigation concept.

Chapter four presents the factors that contribute to accomplishing a marine casualty investigation in a successful way. This chapter will address whether these factors are present in Jordan's legislation and enforcement machinery in a manner capable of fulfilling international obligations.

Chapter five will provide the findings of the SWOT analytical tool applied to the current situation of the casualty investigation implementation in Jordan in order to learn about the potential for future development in Jordan.

Chapter six will present the conclusion and recommendations based on the findings presented in Chapter five in order to improve the current performance in Jordan with respect to marine casualty investigation.



Figure 1The dissertation structure

The next Chapter discusses the international and institutional legal framework that regulates marine casualty investigation in Jordan. In addition, the interaction between the international instruments and the institutional framework will be highlighted clearly to show how the regulatory framework appears with respect to its current implementation in Jordan.

2. Chapter 2 International and Institutional Legal Framework

The interaction at the national level among the constitutional requirements of the State and international conventions and treaties has enormous implications for the maritime governance of all States (Mukherjee & Brownrigg, 2013). The implication such as ratifying the IMOs' conventions and treaties requires the State to enact the legislations that are harmonious with their national needs and in the same time to meets their international obligation (Mukherjee & Brownrigg, 2013). Therefore, to measure the effectiveness of the performance of States in meeting their international obligations. IMO has adopted a mechanism to evaluate the performance periodically concerning its obligations as a maritime administration, the extent of implementation and enforcement of the IMO instruments (IMO, 2013).

Consequently, this Chapter will address the international instruments imposed by IMO and other international organizations that regulate marine casualties. On the other hand, how Jordan respond to these international instruments by forming the legal and institutional framework to ensure maritime safety and avoid recurrence of accidents in the future, which will be discussed as well. Moreover, will be highlighted how Jordan respond to IMO mechanism to measure the maritime administration performance with respect to the marine casualty as Jordan obligations.

2.1 International Instruments

A series of maritime accidents have occurred over the past 100 years and have forced the international maritime community to adopt international conventions on safety responsibility and environmental protection (Ibn Awal & Hasegawa, 2017). Over decades, IMO has made significant efforts to improve and ensure a high and effective standard in regard to safety, considering marine accidents and their prevention a main driver of the many instruments issued and activities undertaken by IMO (IMO, 2019). A remarkable series of conventions and other essential instruments, protocols, amendments, recommendations, codes, guidelines and resolutions that are making shipping safer, simpler and more standardized (IMO, 2019).

The act of ratification is binding, and obligates member States to implement the instruments. In terms of casualty investigation, each member State is obligated to take the necessary measures, in respect of its legislative environment, to undertake investigations into marine accidents. This is an obligation according to the article 94 of the United Nations Convention on the Law of the Sea (UNCLOS), 1982 (UN, 1982).

IMO has focused its concern on maritime safety investigations and their results through a remarkable series of conventions (Figure 2) such as; the International Convention for the Safety of Life at Sea 1974, as amended (SOLAS). The International Convention for the Prevention of Pollution from Ships 1973 (MARPOL), as modified by the Protocol of 1978 relating there to, and by the Protocol of 1997. The International Convention on Load Lines 1966 (LL). Other essential instruments, such as protocols, codes, guidelines and resolutions make shipping safer, simpler and more standardized, by governing the marine casualty investigation process (IMO, 2019).

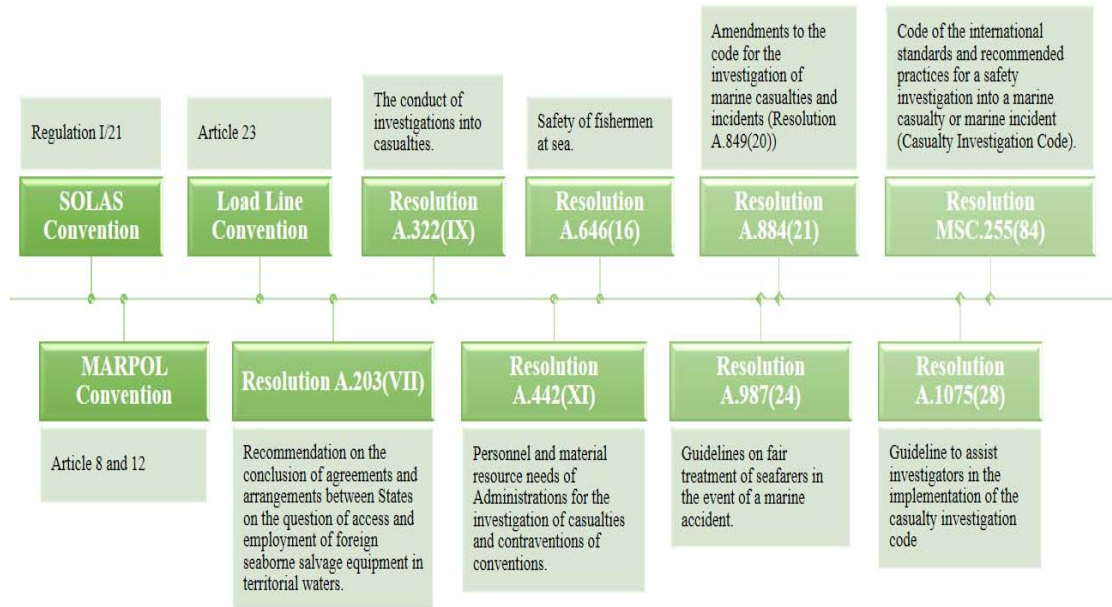


Figure 2 IMO conventions and resolutions related to casualty investigation

Source: (IMO, 2019)

After sinking of Titanic accident in 1912, SOLAS Convention was adopted by international cooperation after two years in 1914 as the first initiative on safety regulations. SOLAS was replaced with many updated versions up to the last one SOLAS Convention 1974 (Ibn Awal & Hasegawa, 2017). IMO has set requirements for the investigation in Regulation 21 - Casualties of the SOLAS Convention 1974, says:

“(a) Each Administration undertakes to conduct an investigation of any casualty occurring to any of its ships subject to the provisions of the present Convention when it judges that such an investigation may assist in determining what changes in the present regulations might be desirable.

(b) Each Contracting Government undertakes to supply the Organization with pertinent information concerning the findings of such investigations. No reports or recommendations of the Organization based upon such information shall

disclose the identity or nationality of the ships concerned or in any manner fix or imply responsibility upon any ship or person” (IMO, 1974).

The accident of oil spill off from The Torrey Canyon on French and Cornish coasts in 1967, call the international maritime community to MARPOL Convention and was adopted in 1973 (Ibn Awal & Hasegawa, 2017). MARPOL Convention is defined the marine accident from the environment perspective, Article 2 – Definition of The MARPOL Convention 1973, says:

“(6). "Incident" means an event involving the actual or probable discharge into the sea of a harmful substance, or effluents containing such a substance” (IMO, 2006).

In addition, the MARPOL Convention specified the States obligations to investigate any casualty may harm the marine environment. Article 12 - Casualties to ships, says:

“(1). Each Administration undertakes to conduct an investigation of any casualty occurring to any of its ships subject to the provisions of the regulations if such casualty has produced a major deleterious effect upon the marine environment.

(2). Each Party to the Convention undertakes to supply the Organization with information concerning the findings of such investigation, when it judges that such information may assist in determining what changes in the present Convention might be desirable” (IMO, 2006).

Similarly, IMO addresses marine accident investigation in the LL Convention 1966. Article 23 – Casualties of LL Convention 1966, say:

“(1) Each Administration undertakes to conduct an investigation of any casualty occurring to ships for which it is responsible and which are subject to the provisions of the present 13 Convention when it judges that such an investigation may assist in determining what changes in the Convention might be desirable.

(2) Each Contracting Government undertakes to supply the Organization with the pertinent information concerning the findings of such investigations. No reports or recommendations of the Organization based upon such information shall disclose the identity or nationality of the ships concerned or in any manner fix or imply responsibility upon any ship or person". (IMO, 2005)

In addition, IMO adopted a resolution on 25 November 1999, and it is an amendment of the Code for the investigation of marine casualties and incidents (Resolution A.849 (20)) (IMO, 2000). The role that this resolution plays is to enhance preventative measures by offering practical advice for the investigation of human factors in marine casualties (IMO, 2000). Moreover, it calls all the States to improve the quality of marine investigation reports and complete the reports as soon as practicable (IMO, 2000).

IMO realized the need to adopt a common approach in conducting maritime safety casualty investigations to prevent casualties in the future. Therefore, IMO adopted resolution MSC.255 (84) on 16 May 2008, the international standards and recommended practices for a safety investigation into a marine casualty or marine incident (Casualty Investigation Code) (IMO, 2008). IMO has designed this instrument as a guide to conducting marine casualty investigations and to regulating and standardizing the investigation mechanism for flag States and coastal States to follow (IMO, 2008).

IMO adopted, on 4 December 2013, Resolution A.1075 (28) and its guidelines to assist investigators in the implementation of the casualty investigation code (Resolution MSC.255 (84)) (IMO, 2014). Despite the best of IMO's endeavors for the purpose of enhancing the safety of life at sea and protecting the marine environment, accidents resulting in loss of life and ships and pollution of the marine environment, continue to occur (IMO, 2014). Therefore, recognizing that remedial measures to reduce maritime

accidents are the best solution, IMO emphasizes the training of investigators and analysis of the sequence of events to identify casualty occurrence. Moreover, IMO stresses the need for cooperation among States to investigate maritime accidents in order to determine their circumstances and causes (IMO, 2014) this resolution revokes both resolutions A.849 (20) and A.884 (21) (IMO, 2014).

It is worth pointing out that the abovementioned instruments are not the only ones being adopted by IMO. IMO has also worked hard to adopt other applicable instruments, for example, the IMO circulation (MSC-MEPC.3/Circ.3) was issued on 18 December 2008. In this instrument, which requires the States to report the casualty investigations to IMO. In addition, IMO has adopted other instruments to conduct audits of the maritime administrations to verify their compliance with the requirements of the international conventions (IMO, 2013).

The States may obtain some benefits by implementing IMO instruments, in particular the enhancing of maritime safety and security and the prevention of pollution from ships. However, these benefits can only be fully obtained when the member States implement the obligations as required under the related instruments (IMO, 2013).

Therefore, IMO has designed key performance indicators (KPI's) to assist the member States in adopting and implementing the conventions to improve maritime safety and environmental protection. Thus, IMO completed the legal framework of the mandatory IMSAS in May 2014 (IMO, 2019). Moreover, IMO adopted the IMO Instruments Implementation Code (III Code) through a resolution A.1070 (28) which came into force on 1 January 2016. This code is focused on the three key aspects for a maritime organization (IMO, 2013). These key aspects are implementation, enforcement and review. Each member State needs to evaluate its performance periodically

concerning its obligations as a flag State, port State and coastal State and the extent of implementation and enforcement of the IMO instruments (IMO, 2013).

Overlooking the main role of the other international organizations to ensure maritime safety and security is difficult. Therefore, a significant venture was made by the International Labor Organization (ILO), to ensure seafarers rights and to achieve decent working conditions on board ship. Maritime Labour Convention (MLC) was adopted in 2006 and entered into force in 2013, as legal instruments in the international maritime regime (Adăscălițea, 2014). Regulation 5.1.6 on Marine Casualties of MLC Convention 2006, says:

“1. Each Member shall hold an official inquiry into any serious marine casualty, leading to injury or loss of life, that involves a ship that flies its flag. The final report of an inquiry shall normally be made public.

2. Members shall cooperate with each other to facilitate the investigation of serious marine casualties referred to in paragraph 1 of this Regulation” (ILO, 2006).

As the previous part elaborated the legal instruments in the international scope regarding the marine casualty investigation. The next part of this chapter will discuss the legal and institutional framework of the maritime administration in Jordan. By focusing on the hard dimension which is the legal framework, and the soft dimension which is the institutional framework in light of its interaction among the international instruments that decreed by the international organizations, and the national needs.

2.2 Legal and Institutional Framework in Jordan

By Jordan Maritime Commission Law No. 46 for the year 2006. A national government entity with legal, financial and administrative authority was established in

Jordan, called the Jordan Maritime Commission (JMC), which is linked to the Ministry of Transport (MOT). JMC plays the role of maritime administration in Jordan (JMC, 2006).

Policy development precedes the issuance of legislation, including regulations and instructions (Mukherjee & Brownrigg, 2013). In policy development, the purpose is not always to enact legislation to implement a specific policy initiative of the government or to promote and protect national preferences. In some cases, member States should meet the legal obligation arising out of the international instruments. Therefore, the member States seek to transform the international instruments into national legislation (Mukherjee & Brownrigg, 2013).

2.2.1 The Legal Framework

According to Article 4 of JMC Law 46, JMC primarily aims to effectively and efficiently regulate, supervise to improve the maritime sector including, all modes of transportation, stationary and moving equipment, labor force, and associated services. JMC Law 46 also provides guidance to implement Jordan's economic and social plans in conformity with the provisions of Aqaba Special Economic Zone Authority (ASEZA) Law. Furthermore, it enhances the private sector's role in contributing to improve and develop the maritime sector. Simultaneously, it encourages competition and prevents monopoly in the sector. Finally, it provides support for the protection of the marine environment by boosting maritime safety standards (JMC, 2006).

In order to achieve the above-mentioned objectives, JMC shall perform several functions, including as per paragraph H, in Article 5 of JMC Law 46, which further elaborates the investigation of maritime accidents and catastrophes within Jordanian territorial waters and on Jordanian ships (JMC, 2006).

JMC has worked hard to establish a legal framework to realize the abovementioned objectives. To this end, technical instructions are issued taking into account the international law in order to meet international standards. These regulations and guidelines at the national level reflect what Jordan has committed to as a member State of the United Nations (UN), since 14 December 1955 (UN, 2019). Similarly, Jordan is a member State in IMO and a signatory to international maritime conventions, since 1973 (IMO, 2019). According to article 9 of the JMC Law 46, the Board of JMC shall conduct several functions and terms of reference, including paragraph K in article 9, JMC Law 46, which authorizes JMC to prepare and enact the instructions for the administration's procedures and operations (JMC, 2006).

In this context, Jordan has a significant interest in adopting all IMO instruments related to casualty investigation affairs. The section below will review the JMC instructions issued to meet the main vital IMO instruments to elaborate JMC's legal framework in casualty investigation matters. The relevant regulations are taken from different conventions.

JMC ratified the SOLAS Convention on 10 October 2006 (JMC, 2019). JMC Instructions for Implementing (SOLAS) have been issued by JMC to comply with SOLAS Convention, 1974 in marine casualty matters, in which it stated that JMC should conduct an investigation into any incident involving any ship belonging to it and subject to the provisions of the Convention (JMC, 2006).

JMC has acquired the obligation to implement and fulfil the requirements of the Casualty Investigation Code through the signing of the SOLAS Convention. Therefore, JMC issued an instruction called "Instructions to Implement the Maritime Accidents and Incidents Investigation Code" (JMC, 2017) hereinafter called Instructions 2017.

In addition, JMC has made an intensive effort to develop measures to improve maritime safety and to conduct maritime investigations according to the MARPOL Convention. JMC signed the MARPOL convention on 2 September 2006 (JMC, 2019); JMC Instructions for Applying the Annexes of MARPOL of 1973 and its Amendments have been issued by JMC to comply with MARPOL Convention in marine casualty matters (JMC, 2006).

Similarly, JMC ratified the LL Convention on 17 August 2000 (JMC, 2019). JMC issued the Instructions for Implementing the International Convention on Load Lines of 1966 and its Protocol of 1988 for the year (2014), to comply with this convention. Article 13 from the LL instruction 2014, states that JMC may investigate any incident involving ships for which it is responsible and subject to the provisions of the LL Convention when it deems that such an investigation may help identify possible changes to the convention. Moreover, JMC shall provide the IMO with the relevant information concerning the results of such investigations, provided that the reports or recommendations to IMO based on such information do not reveal the identity or nationality of the ships concerned or assume responsibility in any way for a ship or a person or even hint at it (JMC, 2014).

In addition, JMC has not overlooked its accession to the MLC Convention. Therefore, a royal decree was issued to approve the Prime Minister's decision 6276 dated on 5 November 2014. This official decision approved Jordan's accession to the Convention (JMC, 2014). Moreover, JMC has issued Instructions for the application of the MLC in response to the ratification on 16 February 2017, to comply with MLC 2006 in marine casualty matters and to achieve decent work for seafarers (JMC, 2017).

2.2.2 The Institutional Framework

Usually, the substantive elements of the maritime policy are largely built on marine environment, maritime safety and security concerns. Admittedly, the policy begins at the top functional levels of management (Mukherjee & Brownrigg, 2013).

The regulatory functions of maritime management personnel are mostly technical in nature and include inspections, technical survey and certification under the various relevant IMO and ILO conventions (Mukherjee & Brownrigg, 2013). Therefore, the human element is indispensable in contributing to the initiation of maritime policy, with its technical and managerial experience, capable of planning and formulating rational policy for consideration by the Director-General (Mukherjee & Brownrigg, 2013).

In Jordan particular attention will be given to JMC's strategic plan, its mission, vision and organizational structure to elaborate on the extent that JMC is the competent authority in implementing the Casualty Investigation Code. Moreover, JMC is working to meet its international obligations to ensure maritime safety through its organizational structure in achieving its vision, mission and objectives that are set out in its laws.

JMC was keen in its vision to establish a maritime sector with a high level of safety and quality and to open new opportunities for investments (JMC, 2019). JMC's mission statement is as follows:

“Achieving the highest International standards for organizing, control and developing of the maritime sector in Jordan including legislation, transportation modes, services and human recourses taking into account the protection of the marine environment and enhancing the maritime safety and security to enhance the competency of the sector and provide best services to customers” (JMC, 2019).

The top management level will formulate policy in this matter as to whether it concerns the ratification of an international convention or treaty by the government. For this reason, the Maritime Administration has begun to consult with national stakeholders in public and private sectors (Mukherjee & Brownrigg, 2013).

On one hand, JMC represents the sovereignty of Jordan in the maritime transport sector as it provides a regulatory environment and further monitors, develops and maintains the marine environment and raises the level of maritime safety and security in the maritime transport sector (JMC, 2017). On the other hand, JMC depends on private entities for certain port operations. For instance, Aqaba Development Corporation (ADC) is an infrastructure developer, working to create a convenient environment for investors. Aqaba Port Marine Services Company (APMS) operates pilotage and towage services. Additionally, Aqaba Company for Ports Operation and Management (ACPOM) is responsible for establishing, developing, maintaining and operating port activities (receiving of ships, handling and storing cargo) to provide customers with a complete package of services to facilitate the customers' cargo operations (JMC, 2017).

The strategic relationship between JMC and the private entities in the Jordanian maritime transport sector provides clear support for the efforts of the maritime administration in several important areas such as maritime safety and security, global connectivity, maritime environment protection, preparedness and emergency response, and marine services (JMC, 2017). Further, these bodies cooperate to improve the maritime transport sector in Jordan and raise the bar up high, with a focus on finding a permanent working mechanism and coordinating periodic meetings to facilitate a working mechanism between the governments and private agencies involved in developing the Jordanian maritime sector, especially in casualty investigations (JMC, 2017).

The organizational structure of JMC was designed by IMO's experts' recommendation when it was established in 2002, reflecting the functions of maritime administrations in line with developments in the nature of maritime work and the nature of the Commission's work to comply with the requirements of IMO to achieve full implementation of the provisions of international conventions (Hubbard & Hoppe, 2001). The organizational structure of JMC was issued coinciding with the promulgation of the Organizational Administrative Regulation of JMC No. (65) 2014, in Issue No. (5291) / the Official Gazette dated 16/6/2014, in which the organizational units in the structure of the Organization are represented their respective tasks determined. (JMC, 2014).

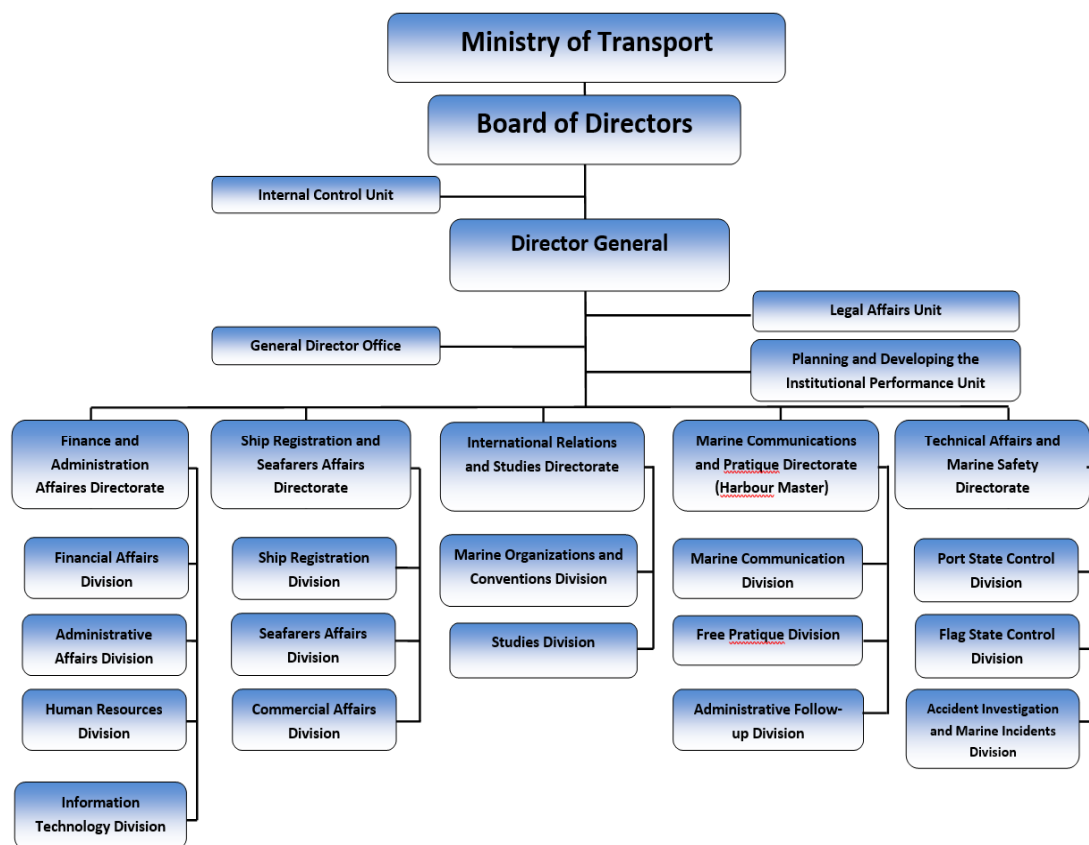


Figure 3 Jordan Maritime Commission organizational chart

Source: (JMC, 2019)

As shown in Figure 3, JMC consists of a Board of Directors, Director General, and Executive Body. The Board of Directors includes the MOT as Chairman, the Director-General of JMC as Vice Chairman, the Commander of the Royal Jordanian Navy Force, two representatives of the public sector and two representatives of the private sector.

In addition, Figure 3 shows clearly the accident investigation division within the Technical and Safety Directorate. Moreover, according to the job description card of this division, the main task is supervising and conducting maritime accident investigations within the territorial waters and on Jordanian ships, wherever they exist (JMC, 2018).

In the last part of this Chapter will address JMC responded to the IMSAS audit as IMO effective measurement tools. In addition, will highlight the findings and observation that the audit report mentioned to enhance the Jordan performance regarding the Casualty Investigation Code.

2.3 Jordan Legal and Institutional Framework after the Audit

It is worth mentioning that Jordan's maritime administration has undergone the IMSAS audit. The audit was undertaken from 14 to 23 October 2016. The audit was conducted through a series of field visits, interviews, and examination of documented records and databases, and objective evidence, to determine the extent to which JMC has achieved the objectives (IMO, 2016). The IMO audit report included findings, observations and corrective actions to help Jordan improve its performance to meet its international responsibilities and obligations.

The IMO audit report stated that JMC has adopted the Casualty Investigation Code. However, it was noted that the requirements of this code are not contained in JMC

Law 46. JMC Instruction 2007 has adopted Resolution A.849 (20) but had not been amended according to Resolution A.1075 (28) which revokes Resolution A.849 (20) (IMO, 2016).

In this context, for the purposes of giving full and complete effect to the provisions of applicable Casualty Investigation Code, the audit team found that there was no objective evidence to prove that Jordan had a comprehensive policy to support, implement and enforce the national legislation and regulations (IMO, 2016). See Appendix 1 (FD-4).

On this occasion, after reviewing and examining the Jordanian national legislation before IMSAS audit. JMC issued on 31 May 2007 instructions called “Instructions for Investigation on Maritime Accidents and Incidents, 2007” (JMC, 2007) in respect to the Casualty Investigation Code, hereinafter called Instructions 2007. (JMC, 2007).

After IMSAS audit JMC responded to the IMO audit report recommendations with corrective action and initiated the necessary corrections to improve the discharge of its duties. To that end, JMC scrambled to issue new instructions. On 16 February 2017, the Instructions 2017 was issued (JMC, 2017). Instructions 2007 was revoked by instructions 2017 (JMC, 2017).

By comparison, between Instructions 2007 and Instructions 2017, it has been observed that Instruction 2007 stipulated eighteen articles in which Jordan has identified several aspects of the Casualty Investigation Code that meet its national needs and fulfil its international obligations (JMC, 2007). However, Instructions 2017 just stipulates four articles as it is: Article 1 states the title of the Instructions 2017; Article 2 states the definition of the Commission as JMC, the Organization as IMO, and the Code as the

Casualty Investigation Code. Article 3 states that JMC just shall apply the Casualty Investigation Code and its rules, and the objectives of the code are an integral part of these Instructions 2017. Article 4 says that Instructions 2017 revokes Instructions 2007 (JMC, 2017).

According to Abu Zeid (2019)¹, it is not necessary, that all provisions of the Casualty Investigation Code should be stated on Instructions 2017. JMC is convinced that Article 3 of Instructions 2017 is meet the international obligations and IMO instruments. Therefore, such as IMSAS audit will not record any findings or observations that related to Jordan's implementation of the international Instruments in the future.

2.4 Summary and Conclusions

Remarkably, Jordan has ratified all the international instruments related to marine casualty investigation imposed by IMO and ILO. JMC as a maritime administration provides for both international maritime policy formulation and its transformation into law, implementation and enforcement. From a practical view, little attention is paid to national requirements. In particular, when JMC had overlooked the national needs and striving hard to maintain Jordan reputations at the international level by issued the Instructions 2017.

The next Chapter will address the current legal and empirical framework in Jordan. A depth clarification to casualties' investigations purposes, marine casualty concept and scope. Moreover, it will discuss the investigation process, methodologies, and scientific models to help in the investigation. In addition, highlight different States' perspective in the implementation of the Casualty Investigation Code.

¹ Abu Zeid, N. (2019, July 15). Head of IMSAS Committee in JMC. (E. N. Al-Mahariq , Interviewer)

3. Chapter 3 Current Legal and Empirical Framework in Jordan

In this chapter will find out how Jordan is implementing the provisions of the code through highlight Jordan law, regulations, policies, procedures and compare it with different academic resources and the provisions of the Casualty Investigation Code. In addition, the authors' opinions - of the academic resources that used in this study - will highlighted different ways and forming policies for different States to implement the Casualty Investigation Code. While perusing and learning these different policies and national laws in implementing. It should highlight the investigation code to know the parts of the Casualty Investigation Code.

3.1 Casualty Investigation Purposes

IMO through the Casualty Investigation Code, (2008), adopts international standards and recommends optimal practices for safety investigation into a maritime casualty. The Casualty Investigation Code is divided into three parts: Part I, titled – General Provisions, Part II, titled – Mandatory Standards, and Part III, titled – Recommended Practices (IMO, 2008).

According to Casualty Investigation Code (2008) - part I, an investigation is intended to prevent maritime casualties in the future. The code seeks to achieve this objective through the implementation of a uniform and harmonized approach to

detecting causal factors that threaten maritime safety. Moreover, the results of reports should be publicized to the broadest range (IMO, 2008).

When a serious marine casualty occurs, the Casualty Investigation Code will rule and dominate in respect to any obligation of the flag State to carry out the marine safety investigation (IMO, 2008). Therefore, identifying the root and immediate factors that caused the accident in a scientific way through collecting the data, analyzing the scenarios and identifying the sequence of the event is the necessary way to reduce accidents and future risks (Roed-Larsen & Stoop, 2011).

The use of adequate measures and a systematic approach may make a major contribution to diminish the risks or minimize damages or unacceptable major impacts generated from accidents (Roed-Larsen & Stoop, 2011).

In Instruction 2007, JMC was set out clearly the main objective of conducting marine casualty investigations in order to prevent future incidents occurring (JMC, 2007). However, after the IMSAS audit it was noticed that Instruction 2017, which is issued as a corrective action did not mention the purpose for conducting marine casualty investigations (JMC, 2017).

From the above, the importance of carrying out marine casualty investigations for developing sufficient measures to prevent and avoid future casualties is understood. The following sections will highlight by comparing different States and Jordan current practices on these matters. In particular the marine casualty concept and scope, in both the mandatory and recommended standards in the Casualty Investigation Code, 2008.

It should highlighted States Such as the Republic of Marshall Island (RMI), the United States' (US) Coast Guard, and Poland as a member State in the European Union

(EU). Whereas, EU regulations apply directly in EU member States. These States showed a logic implementing and well transforming of the Casualty Investigation Code provisions into each States' laws and national regulations to meet the international obligations and national needs.

3.2 Understanding the marine casualty concept and scope

This part commences with highlight the definition of marine casualty, which leads to determining the responsibilities of those involved in the casualties or agencies that have to investigate the accidents. Whereas, the small difference in the given definitions between the States regulations provokes different responsibilities for the parties involved in the marine investigation process. Thus, these various definitions lead to enhancing the understanding of the concept of the marine casualty investigation as a common process requiring collaboration and coordination among parties.

According to Article 2.9 in Chapter 2 – Definition of the Casualty Investigation Code, the marine casualty can be defined as any event resulting from an occurrence linked to operations connected to the ship (IMO, 2008). These occurrences are clearly stated as loss, death, or serious injury to a person on the ship; the loss, or abandonment or any material damage of a ship or serious threat to the safety of the ship; ship collision; severe damage to the environment, caused by a vessel or damage to a vessel (IMO, 2008).

Concurrently, in Article 2.9 of the code excludes any neglect acts or the sequence of the neglect acts that linked to operations connected cause damage to the ship is not encompassed under the marine casualty definition (IMO, 2008). In addition, the Casualty Investigation Code gives specific and clear definitions of serious injury and

severe damage, to avoid inaccurate implementation of the provisions of this Code (IMO, 2008).

The US Coast Guard identified in its national regulations that the only marine casualties that it will investigate are reported casualties because the government does not have the resources to investigate all marine casualties (McNamara, 2016). Therefore, the US Coast Guard regulations limited the definition the notion of “serious marine incident” as a marine casualty that caused or linked to a vessel, which is the reported one (McNamara, 2016).

A deeper understanding of the marine casualty concept and scope clarified the investigation scope in US Coast Guard. Which ship is applicable to investigate according to the Casualty Investigation Code in the US? The US Coast Guard has determined in its national regulations the category of targeted vessels that are geographically investigated, those include, but are not limited to, US ships anywhere and vessels flying foreign flags in navigable waters of the US (McNamara, 2016).

The US Coast Guard has not complied with the definition stated in the Casualty Investigation Code. However, in accordance with its national requirements, the US Coast Gard laws have adapted the definition to suit what is required in its national needs.

EU is issued directives, which it should need to be transposed into national legislation of the EU member States as Poland. Article 3.2 of the Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, Says That these terms “marine casualty, very serious casualty, marine incident, marine casualty or incident safety investigation, lead investigating State, and substantially interested State” should be understood according to the Casualty Investigation Code (EU, 2009). As well as, Article 3.3 of the Directive 2009/18/EC of the European Parliament and of the Council

of 23 April 2009, Says That “serious casualty” definition should be consistent with the definition of IMO and that updated with one included in MSC-MEPC.3/Circ.3 (EU, 2009).

Poland is transposed the mentioned above directive into its national legislation. According to Luczywek (2017), in the Polish Act, Article 2, in the definition of “a very serious casualty”, a marine casualty implies the death of a person, a vessel total loss and harmful environmental damage, which has results such as; any damage that makes the vessel unseaworthy, or causes environmental pollution, or any severe damage requiring towage the vessel. The Polish Act maintains the definition of a “marine incident” as stated in the Casualty Investigation Code provisions (Łuczywek, 2017).

Jordan’s regulations do not mention the "maritime accident" or "marine incidents" concepts because the JMC is content with indicating in the Jordanian regulation, Article 3, that Jordan applies the Casualty Investigation Code and considers the provisions of the code as integral parts of the JMC regulations. In other words, Jordan omitted to set its own definition in harmony with Jordanian national requirements (JMC, 2017).

From above despite some States replicating the same definition of the marine casualty concept from the Casualty Investigation Code into their national legislation. However, these States try to meet international obligations by commensurate with national needs. The such stated of the marine casualty concept or define the investigation scope is considered as the right action to ensure the minimum requirements from the international obligations so even if it is replication so it is enough to let the national maritime community understand that the State has the legislation that stated the marine casualty concept and scope.

From above the right understanding of the marine casualty concept and the well, define the marine investigation scope lead to an effective investigation. Therefore, each variation and refinement of the term “marine casualty” will serve a particular national need and fulfil international obligations. This understanding will help the investigators to start the effective investigation process and methodology.

3.3 Casualty investigation process and methodology

The investigations of maritime accidents are considered to be more than a means of identifying the causes of maritime accidents. Rather, the marine accident investigation is considered as a means of identifying safety deficiencies in the overall management of the operation from policy to implementation by resorting to the concept of investigation analysis by applying the clear process and methodologies, which depend on the scientific methods (IMO, 2008).

Resolution A.1075 (28) on Guidelines to help investigators in the implementation of the Casualty Investigation Code (Resolution MSC.255 (84)) identifies the extent of the maritime safety investigation by five areas: people, environment, equipment, processes and procedures, and organization and external influences. Thus, safety investigations are sufficient to meet maritime safety standards (IMO, 2014).

By drawing on the concept of safety analysis, IMO has been able to set out in Resolution A.1075(28), (2014) accident causation models such as a combination safety analysis and reconstruction of the casualty, that are directly connected with reconstruction events (IMO, 2014). The resolution A.1075(28), (2014) highlights other efficiency safety analysis tools, which can be deducted from causation models of accidents, such as deeper questioning and direct communication and investigation of

indirect or hidden causes, to enhance the development at all appropriate levels of effective corrective action (IMO, 2014). However, this resolution does not obligate States to use specific tools.

Nonetheless, it is known that the investigators may use the accident causation models to achieve optimal investigation. Then, the main question is whether the marine accident investigators in JMC apply accident causation models. If the answer is yes, which models are used? Before elucidating on this, a summary of accident investigation procedure and methodology will be discussed in general.

Figure 4 shows investigation procedures in line with the Casualty Investigation Code, according to Soliwoda (2014). Soliwoda undertook preliminary work on the procedures by dividing marine casualty investigations into three steps. The first step is data collection, which involves developing a sequence of events through the collection of information. Subsequently, the second step is the classification of the causation factors. In this step, the unsafe conditions and circumstances can be identified by expert investigators by determining the working environmental causation factors. Finally, the third step is to reduce the possibilities of accidents related to human errors and vessel machinery by developing safety actions. It is required to identify the possible safety problems in order to develop safety procedures (Soliwoda, 2014).

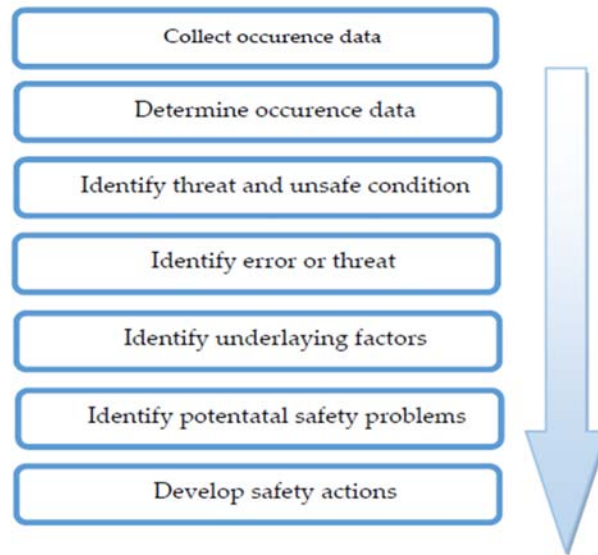


Figure 4: Investigation procedures according to Casualty Investigation Code

Source: (Soliwoda, 2014)

Soliwoda (2014) examines the significance of models in the vessel casualty process and identifies the major causation factors that might cause identified unsafe acts to occur. These systematic models, including the SHELL Model, the Cognitive Process Model, and Marine Root Cause Analysis Technique (MaRCAT), designed by American Bureau of Shipping (ABS), help the investigators to identify the errors that may be occurring in the whole process in the system (Soliwoda, 2014).

Cassama (2015) provided an in-depth elaboration of the casualty investigation process and methods. Initially, the study pointed out that the investigation procedures begin before the arrival of investigators to the marine casualty scene. A meeting is initially held to facilitate the exchange of knowledge among investigators and the development of the investigation plan, especially if there is more than one State participating in the investigation (Cassama, 2015).

The collection of factual evidence of importance to the course of the investigation should be considered. This may include witness statements through interviews. In addition, a review of records, documents and material evidence, such as the Voyage Data Recorder (VDR), should be undertaken (Cassama, 2015).

The next step is to assess the factors that contributed to the accident, such as the safety management system of the ship through its policy and implementation. In addition, the context of human factors involving interactions among machines, the crew, and the management system should be considered (Cassama, 2015).

According to Cassama (2015), the root cause of the incident can be identified by reconstructing and linking events. This is called a sequential description of events to identify information gaps and inconsistencies in the evidence and factors that contributed to the accident. It is possible in this step to use different causal models of accidents as tools for safety analysis. The final version of the maritime safety investigation report should be released at this stage (Cassama, 2015).

Interestingly, it was observed that whether the investigation is simple or complex, the investigation model helps to focus on the object of the investigation. Moreover, the model helps to find out the cause of the accident by direct investigation using scientific methods (Cassama, 2015). Cassama shows two kinds of investigation models. The first is the traditional models and the second is the system theory approach. The most commonly used investigation models are the SHELL model and Reason based model.

As well as, Article 5.4 - Obligation to Investigate of the Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009. In this article, the EU obliged all investigative bodies in all EU member States to investigate according to the

common approach adopted. In some cases, to achieve the investigation purposes that rely on professional judgment can the investigators leave the common approach (EU, 2009).

EU is strived to develop the adopted a common marine casualty investigation methodology. In pursuant of Article 5.4 - Obligation to Investigate of the Commission Regulation (EU) No 1286/2011 of 9 December 2011, EU defines the common methodology is started by operational readiness as a preparedness plan to ensure that unnecessary delays. Initial assessment and response are considered as a critical step to quick response with possibilities to minimize losses. Setting out a strategy for scope, timing, and direction of the investigation to collect the evidence. Moreover, looking for the proper analysis to identify the causation and other contributing factors to take the corrective action. Finally, the safety recommendations are highly needed (EU, 2011).

As mentioned above, one phase of marine casualty investigation According to EU Directives is collecting the data. EU has obliged the investigation bodies for EU member States to obtain the information from the VDR. Therefore, the investigators should ensure the VDR information is saved to check all the information related to the marine accident (EU, 2011). These Directives have been transposed in Polish law in the following manner:

Strong evidence was observed in the Polish Statute, through a detailed examination of the casualty investigation process and methods by Łuczywek (2017). Moreover, the investigation process requires the investigators to go far beyond direct evidence of the circumstances during the investigation to prevent future casualties. In addition, the Polish Statute, as well as the resolution A.1075 (28) identify the scope of any maritime safety investigation by five areas: people, environment, equipment, processes and procedures, and organization and external influences (Łuczywek, 2017).

Hence, the Polish Statute illustrates the investigation process, starting with accessing the location of the maritime accident; collecting the data and making the proper analysis. Then, a request is made to the chairman of the commission for the necessary surveys, and permission to conduct the marine investigation. The investigators should have access to documents, information and data. Furthermore, they should have the right to copy the important data or take a copy of VDR recorders. The investigators should interview the crewmembers and employees on board that were involved in the maritime accident. Finally, information and documents relating to the vessel inspection should be obtained (Łuczywek, 2017).

In order to reconstruct how a casualty has happened, it is sometimes necessary to conduct a specialized systematic analysis. For instance, for a specialist analysis of weather and sea conditions at the time and place of the casualty, the Polish Statute gives the commission the right to cooperate with institutes such as the Institute of Meteorology and Water Management – National Research Institute (IMGW) (Łuczywek, 2017).

In contrast, in relation to Jordan's implementation of the Casualty Investigation Code, 2008, Jordan has been found to conform to the quality management system standards consistent with the management system certificate, International Standardization Organization (ISO 9001:2015). JMC issued the process manual (2018), shown in Figure 5, containing the JMC procedures for conducting a maritime investigation. Sections 049 and 153 of the process manual contain the procedures to carry out the investigation of a maritime accident occurring in Jordanian territorial waters or on board a vessel flying the Jordanian flag, wherever it may be (JMC, 2018).

Sections 049 and 153 in JMC Process Manual 2018, indicates that the master, agent owner, manager, operator, or person in charge of the vessel shall notify the

administrator in any instance of an occurrence of a maritime accident. The investigator starts the investigation procedures immediately by gathering the information and evidence to identify the reasons and the root cause of events to make the proper recommendations to prevent similar incidents from occurring in the future (JMC, 2018). Similarly, In addition, the IMO audit report was recommended that JMC should implement, establishes policies and procedures with respect to the Casualty Investigation Code and relevant resolutions (IMO, 2016).

Moreover, concerning the information, data or records obtained during the investigation. The Instructions 2007 stated that this evidence must not be disclosed for purposes other than an investigation and only with the consent of the party providing the information. Moreover, JMC decides how much information can be included in the final report (JMC, 2007). The instruction 2017 revoked the Instruction 2007 in regard to data and record handling.

The investigator issues the final investigation report and submits the report to the Director-General of JMC. The report should be entered into the Global Integrated Shipping Information System (GISIS) - a marine casualty and incident module, and a hard copy of the final report kept in the directorate archives (JMC, 2018).



Figure 5: JMC procedures to conduct a marine casualty investigation

Source: (JMC, Process Manual, 2018)

From the previous part of this Chapter, while implementing the documented investigation process. The investigators should rely on scientific models as Cassama, (2015) stated a different kind of models such as the SHELL model and Reason based model. Therefore, for a significant role of these models, IMO resolutions and various studies regarding the casualty investigation highlighted some models that help the investigators to find the causation factors that led to a marine casualty.

3.3.1 Casualty Investigation models

To maintain ship safety improvement, IMO adopted a common approach for the marine casualty investigation process. If each investigator uses an individual approach to the marine investigation process, standardization of casualty investigations will not be obtained (Cassama, 2015). Therefore, accident investigation techniques and mechanisms are adapted by using common methods, which should build on a model to support the analysis process. This will achieve the goal of unifying investigative methods. One can also say, the accident causation methods help gather data in conjunction with the accidents models approach (Cassama, 2015).

To prevent similar casualties in the future, resolution A.1075 (28) was intended to draw guidelines recommending the States to adopt a systematic investigation of marine casualties and develop an effective analysis and preventive action (IMO, 2014). Thus, a significant definition of “casual factor” was illustrated in the Casualty Investigation Code (2008) as actions, neglect, events, circumstances causing a marine casualty, or marine incident to occur or probably occur as well as the adverse consequences linked with the marine casualty or marine incident (IMO, 2008).

The Casualty Investigation Code was not limited to this definition. It also defined the five terms, the contributing factors, safety deficiency and issue. That affects the

sequence of events leading to a casualty occurrence, and how it should be classified using the five terms, as shown in Figure 6 (IMO, 2014).

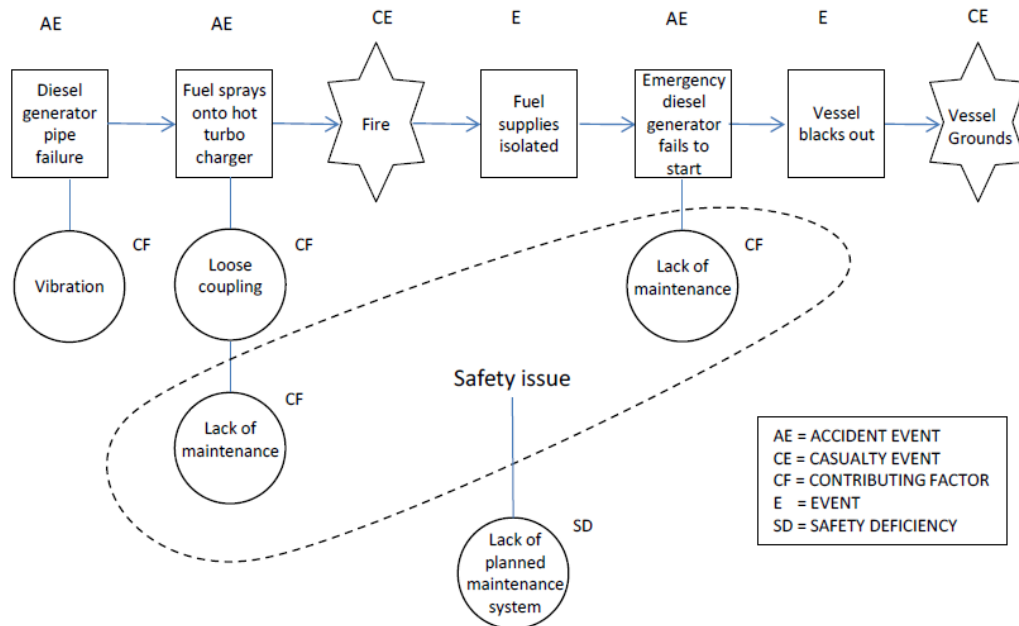


Figure 6: A sequence of events leading to a casualty occurrence

Source: (IMO, 2014)

A Danish accident that occurred on 15 July 2009, elaborates the necessity to identify the causal factor is an increasingly important reason to apply the investigation Models. The primary purpose is to prevent recurrence of similar accidents when the investigators identify the causal factors. For instance, according to Hedlund (2017), this accident that occurred during the passage of the Baltic Sea. The accident resulted of two seamen died from carbon monoxide poisoning. Because of a lack of ability to identify the causation factors and no indication of wrongdoing, the investigation was closed. Moreover, the investigation findings were kept out of reach (Hedlund, 2017). Therefore,

no lessons were learned, and other fatal accidents later took place in Denmark (Hedlund, 2017).

The majority of maritime casualties are caused by human factors/errors. To investigate the root causes related to the human factor (Lee, 2016), the SHELL model, used in the data collection phase, and the Reason Hybrid model, used in the analysis phase, are highlighted.

The SHELL model deployed by The International Civil Aviation Organization (ICAO) is a simple model to provide assistance in investigating the effects of human error on the maritime casualty, describing and building an understanding of how the human element interactions with technical systems components. SHELL stands for Software, Hardware, Environment, Liveware (central component), and Liveware (peripheral). Therefore, this model can be used to provide guidelines on where the investigators should look for evidence. It helps with the “who”, “where”, and “what” (Lee, 2016).

The Reason Hybrid Model is an epidemiological model that focuses on analysing the “How” and “Why” to identify the unsafe conditions considered causation factors that contributes to the maritime casualty. This model uses the data collected by the SHELL model concerning the event and circumstances in relation to five elements: decision makers, line management, preconditions, productive activities, and defence (Lee, 2016).

The IMO audit report advised Jordan to determine and assign responsibility for the development of methodologies and evaluation criteria to give full implementation to the applicable Casualty Investigation Code (IMO, 2016). Therefore, the IMO audit report recommended that JMC should establish a policy consisting of guidelines,

processes, procedures, and key performance indicators, combined with a Quality Management System (QMS) (IMO, 2016).

JMC's procedure for conducting a maritime investigation is shown in Figure 5. However, the stated procedure is superficial and ambiguous. For example, it requires analyzing the root causes of the marine casualty, without specifying procedures or providing models for the conduct of such an analysis (JMC, 2018).

The investigation models in IMO Resolution and the Casualty Investigation Code is stated clearly. In spite of that, the evidence presented in this section suggests that JMC's process manual 2018, tries to determine its casualty investigation process and methodology superficially. Moreover, far too little attention has been paid to state the casualty investigation process even in the national regulations or clarify it more accurate in the JMC process manual.

After the investigators defined, the causation factors that led to the accident by collected the data and analyzed it based on the scientific models. The investigators now are ready to write and prepare the casualty investigation report. This report should comply with the Casualty Investigation Code and the related resolutions.

3.3.2 Casualty Investigation Report

Timely and accurate marine casualty reporting as a remedial action is an important part in the casualty investigation process and plays a key role in improving maritime safety to prevent and reduce anticipated risks resulting from similar accidents in the future (Łuczywek, 2017).

The Casualty Investigation Code deals with the marine safety investigation report through the mandatory part and the recommended practices part. The mandatory

part obliges each State to send a copy of a draft marine investigation report to whoever is interested, giving them thirty days to comment. This includes stakeholders such as the flag State of the ship or the coastal State involved in the casualty or whose environment was damaged by a marine casualty. In addition to that, a State that has lost the lives of its nationals or a state with any other reason considered significant by the marine casualty investigation may comment on the report. However, when the 30 days has expired, no comments will be considered (IMO, 2008).

It is worth mentioning that the IMO sought opportunities to learn lessons from marine incidents, casualties and accidents. IMO circular MSC-MEPC.3/Circ.4 requires that the final marine safety investigation report be entered for on-line reporting directly and electronically into the marine casualties and incidents module in GISIS (IMO, 2013).

Each State is obliged to submit the final copy of the investigation report to IMO for each investigation into a serious marine casualty or a casualty or incident other than a serious casualty that may prevent a similar casualty in the future. This report shall be available to the public with details (IMO, 2008).

According to Łuczywek, (2017) The Polish Law 2012 abides by the Code and show strong transformation for the International obligations into the Polish legislation. More detailed in the legal provisions to oblige the investigation body, which is the Commission, to prepare and publish the final marine casualty report. Moreover, define the structure of the report to include the basic facts injured persons, environment pollution, flag State of the vessel, classification society, operator and the owner of the vessel, and vessel information such as the size and the crew member information. In addition, to be included are the accident sequence description, the models and methods

used for the analysis to define the causation factors and the results and safety recommendations (Łuczywek, 2017).

The EU Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, says that under this Directive shall ensure the accurate and timely reporting. This investigation should not determine any blame or liabilities. However, shall be proposed remedial actions (EU, 2009).

One of the significant issues in Poland is transposed, EU Directive 2009/18/EC into the Polish Law. The Polish Law stated in the provisions, is that the marine casualty report should be published within twelve months of the marine casualty. Moreover, the report should not consider as evidence in criminal or other proceedings (Łuczywek, 2017). The Casualty Investigation Code states that the investigation report is not aimed at determining blame or liability (IMO, 2008). In case of safety deficiencies creating serious risk, the investigators immediately inform the responsible party, so the risk can be managed. (Łuczywek, 2017). Moreover, the Commission follows up every recommendation after submitting the final report and promotes positive safety actions taken by making it public (Łuczywek, 2017).

Formerly in Jordan, JMC Instruction 2007 stated that it is obligatory to send a copy of the final report of the marine casualty investigation to the relevant States and to IMO (JMC, 2007). However, the Instructions 2017 did not mention any specific or clear provisions obliging the JMC to send a copy of the final investigation report (JMC, 2017).

However, it is mentioned in the Process Manual 2018, that the investigators should prepare a marine casualty investigation report and submit a copy to the Director-

General of JMC and a copy to IMO, by submitting the report to the GISIS module (JMC, 2018).

Additionally, the IMO audit report recommended that the safety recommendations of the final investigation report be publicized and the investigation report submitted to IMO through the GISIS Module (IMO, 2016). See Appendix 2 (FD-8).

According to JMC investigation records, the investigation division of JMC has carried out 34 safety investigations (JMC, 2019), published no (0) marine safety investigation reports to JMC's website and submitted two safety investigation reports to the GISIS module (JMC, 2019).

Another major source of uncertainty is in the way a marine casualty investigation report is used in Jordan. If we look at Poland how dealt with the EU Directives and the Casualty Investigation. Poland has stated the marine casualty investigation report more accurately in Polish law. This way gives the impression of effectiveness in the implementation and stresses the extent of Poland's commitment to the code provisions. In contrast to the Polish case, Jordan dealt with the code through one-provision, stating that Jordan is obliged to follow the requirements of the code. However, Jordan does not refer to the investigation report in its law or regulations generally or in detail. Only the JMC process manual refers to the obligation to prepare an investigation report without indicating any details such as the type of accidents or ship type.

3.4 Summary and Conclusions

As noted from above, Jordan, represented by JMC as the maritime administration, did not establish a specific definition of maritime casualties. It merely

stated one provision, namely that the code is an integral part of the marine investigation instructions in Jordan. Therefore, JMC has left the involved entities to interpret and estimate the provisions of the casualty investigation code in a way that suits them. For instance, it would be difficult for them to know how marine casualties are defined or which casualties JMC would investigate.

However, it is noted from the practical cases discussed above that some States have clearly stated the definition of marine casualty, and specified which cases require investigation in their national regulations and law in accordance with the national requirements of the State. Consequently, these States are clear and firm in their regulations, demonstrating their commitment to abide by the national regulations and fulfil their international obligations.

As for the investigation process and methodology, Jordan has shown documentation of the investigation process in the approved process manual 2018, which is a positive aspect. However, when the logs of investigation process were reviewed, it was noted that JMC did not document in detail its procedures of any of the models for determining causation factors in a maritime accident. Thus, without working and inference by these systematic and scientific models, which is recommended by IMO in its resolutions, it would be difficult for marine investigators in Jordan to identify the causation factors of an accident.

At the end of this Chapter, it was discussed that Jordan, as a member State, has not fully complied with the decision of the IMO conventions and resolutions to provide it with marine investigation reports or at least to publish them on the JMC website to disseminate maritime safety recommendations.

The investigation process and methodologies should be implemented effectively. Therefore, there are many factors that should be considered to achieve the main aim from the marine investigation. The next Chapter will address the contributing factors that influenced marine investigation.

4. Chapter 4 Contributing factors in marine investigations

To carry out the maritime accident investigation process and come up with a final report requires suitable maritime safety recommendations that help to prevent the recurrence of marine casualties in the future. In this case, the investigation process requires some factors to have an effectiveness investigation. For example, it should be an accredited body that carries out the responsibilities of the marine casualty investigation process in which maritime investigators are competent, experienced and have the necessary authorities or delegations to enable them to implement and meet the international State's obligations of the requirements of the Casualty Investigation Code.

These factors are stated in the provisions of the Casualty Investigation Code. Thus, this Chapter will address these factors, whose presence is seen as a contribution to the success of the marine casualty investigation. Moreover, this Chapter will address Jordan's status with respect to these factors to fulfil its obligations. Moreover, the Chapter discusses how some other cases have provided these factors to facilitate the casualty investigation process and have fully met their international obligations by implementing the Casualty Investigation Code.

4.1 Casualty Investigators

In the view of Nuutinen & Norros (2007), the nature of carrying out an investigation process is described as a retrospective process (Nuutinen & Norros, 2007). In other words, a primary concern involves rebuilding the sequence of events. To that end, key abilities in respect of identifying the root causation leading to a maritime casualty are being knowledgeable about data collection and evidence-gathering mechanisms and interview techniques as well as methods of analysis by identification of human and organizational factors and by applying the casual factor models to marine accidents (IMO, 2014). This investigation process requires a qualified, well-trained and competent marine investigator to be able to achieve a systematic investigation to improve maritime safety and prevent similar casualties in the future (IMO, 2014).

IMO in the Casualty Investigation Code and related Resolutions does not specify the type or quality of the training or the degree of the qualifications that the investigators should possess. It only states that they should be adequate and sufficient to the marine casualty areas. This has been left for each State to decide according to its national capabilities (IMO, 2014).

So far, two factors have been identified as being potentially important: qualifications and sufficient training. IMO is keen in the guidelines Resolution A.1075(28) to assist investigators in the implementation of the casualty investigation code. For qualified and well-trained investigators, the marine safety investigation body should set out a specialized training program (IMO, 2014).

Article 10.3(g) - EU Directives 2009/18/EC of the European Parliament and of the Council of 23 April 2009, says that EU member States should provide relevant training for the investigators (EU, 2009). A notable example is Poland by transposed the EU Directives into the national legislation and was more precise and detailed in terms of

determining the qualifications and degree of education and what specialization of the qualification the maritime investigator must hold. Furthermore, it specifies what knowledge the investigator must possess in safety of navigation and protection of the marine environment, with at least five years' experience, to be a member of the commission formed to investigate a marine casualty. In addition, it is important that the investigator be a Polish citizen, have the full legal capacity and not be guilty by final judgment of any crime intentionally (Łuczywek, 2017).

Similarly, Jordan has set out the qualifications of the marine investigator at the JMC to have a Master's degree in maritime affairs or marine qualification, either first marine engineer or master or second marine engineer. Moreover, the investigator should have serviced as a marine engineer or master on board a merchant's vessel for fifteen years and had experience as a flag State surveyor or port State officer for at least one year (JMC, 2018).

In addition to the above criteria, JMC stipulated that the investigators which likely will hire should have sufficient knowledge of the laws and regulations issued by the IMO. This condition is stated in the job description card, that is issued by JMC and accredited by the Civil Service Bureau (CSB). The CSB is the responsible body for managing human resources and organizing the governmental employee's affairs in Jordan (JMC, 2018).

To ensure the effectiveness of the investigation process according to the Casualty Investigation Code, the administration is entitled, if it deems necessary, to use temporarily qualified and expert investigators or use consultants to obtain expert advice on any aspect of the marine safety investigation. Those experts should investigate in accordance with the Casualty Investigation Code (2008).

This can be seen in RMI; the RMIs' maritime regulations generally determine that the deputy commissioner with supervisory expertise and carrying out a maritime investigation retains the full powers to assign an officer for the purpose of carrying out the marine investigation (Republic of Marshall Island, 2015). As necessary, the RMI maritime regulations state that to obtain additional assistance, get technical advice or assist in the Investigation, the senior deputy commissioner or the deputy commissioner may appoint individuals, organizations or agencies with the appropriate expertise (Republic of Marshall Island, 2015).

The presence of specialized, qualified and experienced investigators contributes greatly to the effective investigation in general (Roed-Larsen & Stoop, 2011), whereas the lack of these factors, whether the expertise in the field, specialized and continuous training in modern investigative techniques may hinder the investigation (Roed-Larsen & Stoop, 2011). As a result, the effectiveness of the investigation will be significantly affected, jeopardizing the main objective of ensuring maritime safety (Roed-Larsen & Stoop, 2011).

It is worth mentioning that JMC instruction 2007 stated that a committee formed of members including investigators of JMC, a member of the Royal Jordanian Navy Force and an investigator from ACPOM carries out investigations of marine casualties on a small ship. Moreover, the JMC Director-General shall be entitled to seek such assistance, as deems appropriate to assist in the investigation if required (JMC, Marine Investigation Ins., 2007). However, this article no longer exists in the new instructions 2017 issued by JMC (JMC, Marine Investigation Ins., 2017) after the IMSAS audit in 2016.

According to Salman (2019)² the Director of Technical Affairs and Marine Safety Directorate, JMC shows that in some investigation cases, such as the M/V Pella investigation (JMC, 2011) a temporary investigator or private company can be hired to assist with issues related to VDR (Salman, 2019). However, after checking to try to find a provision in the JMC's laws, regulations or procedures, there was no evidence mentioned in relation to the opportunity to have external assistance in conducting a marine casualty investigation.

JMC has benefited from training courses, and programs offered by maritime organizations specialized in training, whether IMO or European Maritime Safety Agency (EMSA), to ensure maritime safety. Therefore, JMC has dispatched its only marine investigator to attend specialized training courses and workshops in the maritime field. For this matter, the training records related to the marine investigator were reviewed in JMC (JMC, 2007-2019). It was noted that the total number of training courses held and utilized during 2018-2019 was four comprehensive training courses in various maritime topics through external courses and workshops (JMC, 2007-2019).

IMO audit report 2016 recommended that JMC should ensure the impartiality of the investigation by exclusive investigators properly trained and supported by sufficient resources (IMO, 2016).

In JMC, a holistic approach is utilized by integrating investigator qualifications and sufficient training to meet its obligations in respect to the Casualty Investigation Code 2008. This finding may help to understand that Jordan has a strong point in the marine investigation.

² Salman, M. A. (2019, July 15). Director of Technical Affairs and Marine Safety Directorate. (E. N. Al-Mahariq, Interviewer)

4.2 Casualty Investigation Body

4.2.1 Power of the investigators

According to the Casualty Investigation Code, (2008), all States shall provide in their national laws to ensure investigators that perform a maritime safety investigation have the authority and powers to carry out their duties and accomplish the investigation process. This includes the ability to board the vessel and meet the master, crew and any other involved person to obtain evidence for the purpose of the investigation without any hindrance (IMO, 2008).

A qualified and well-trained investigator will not be able to carry out the investigation to facilitate and meet the State's obligations with respect to the Casualty Investigation Code requirements without adequate human and financial resources (IMO, 2008).

According to Polish law, the Commission, which carries out the investigation, is obliged to investigate every serious injury. After a preliminary assessment of the causes, the Commission has the right to decide either to proceed or to abandon it. When making a decision, it shall take into account the seriousness of the accident, the type of the implicated vessel or cargo, and whether the results of the investigation shall contribute in the future to the prevention of marine accidents (Łuczywek, 2017).

As a good case that shows the importance of drawing the lines of power through the regulations, we recall the case of the RMI. Under RMI Law, it has been generally indicated that marine investigations are carried out in RMI under the RMI Maritime Regulations, which are promulgated under the Maritime Act 1990 of the RMI and issued by the maritime administrator. The RMI marine investigations are aimed to enhance the

safety of life, property, and marine pollution at sea by preventing offences, marine incidents, marine casualties and future accidents (Republic of Marshall Island, 2015).

The Maritime Regulations in RMI limit some of the investigator's powers by stating certain functions and excluding others. For instance, in dealing with original equipment and documents, the investigator shall not be authorized to take them off a vessel unless the marine safety investigation authority. The body responsible for carrying out the investigation in RMI indicates fundamental legal reasons for why it is necessary to take the original documents or remove equipment from the vessel (Republic of Marshall Island, 2015).

The enactment and enforcement of the international instruments through national laws, is giving the States the power and the authorization to ensure the maritime safety by implementing the casualty investigation procedures (Pomeroy & Earthy, 2017). This is evident in both cases Poland and RMI because they have clear and explicit articles in the regulations. However, does this mean the limitation of some powers or authorizations of the investigators are considered as a weak point in some casualty investigation regulations? Of course, the answer is no. The existence of explicit legal provisions, this will give the powers to all parties involved in the investigation process, whether they are managers of the top levels, investigators, master of the ship or the crewmembers. This leads to a clear understanding of the responsibilities assigned to the investigators. In this case, there will be no lack of awareness of the responsibilities assigned and does not lead to nescience in practicing the roles.

In Jordan, according to Article 20, JMC Law 46 states that for the purpose of implementing the provisions of this law, the Director-General of JMC, or the employee commissioned by him, shall be considered a Judicial Police authorization. Moreover, this provision in the JMC Law 64, grants the investigators the power to inspect and enter

anywhere in the ports and on board ships and review the documents and express reservation on any of them (JMC, 2006).

However, under Jordanian governmental policies, the elements of this doctrine were established in a different way. It is generally thought that the decision of the Jordanian Prime Ministry started the development of good faith in economic performance in Jordan. The council decided to adopt a policy of rationalization and adjustment of expenditures, including travel expenditures, in all governmental bodies' budgets, including JMC budget. (Prime Minister Council, 2017).

According to (Abu Zeid, 2019), such a decision has limited the investigators' ability to travel to investigate any maritime casualty occurring on board a vessel flying the Jordanian flag in another coastal State. The procedure to travel for the purpose of investigating on board a Jordanian vessel in another country will require a lot of time to obtain permission. Abu Zied (2019) also stated that in such cases, the Jordanian flag State must request a copy of the investigation report from the coastal State involved in the marine casualty.

Despite the Judicial Police authorization was granted to the investigators in Jordan. The investigators will not be able to investigate a national ship that involves accidents in international waters. Interestingly, the authorization granted to the investigators in Jordan was observed to be limited.

4.2.2 Independent Investigation Body

The importance of the investigative process and the noble goal of increasing maritime safety. The independence and objectivity of the investigators are also considered to be major and pivotal aspects related to the marine casualty investigation

process. The objectivity factor is deemed as an influencer that may affect the investigation and thus depart from the main objective of the investigation report (Syafiuddin, 2016).

IMO has made a recommendation in Part III on recommended practices, Chapter 16 - principles of investigation according to the Casualty Investigation Code, (2008). It is stated that the investigation body should be independent to ensure the free flow of information during the marine casualty investigation; such an investigation should be independent and impartial. To ensure this result, the investigators must be functionally independent of the parties involved in the maritime incident, independent from judicial proceedings, independent from anyone who may take rigid action against individuals or organizations linked to the maritime incident (IMO, 2008).

These investigators according to the recommendation of the Casualty Investigation Code, (2008) should also be free from any intrusion with deference to the investigation process (IMO, 2008), which is illustrated in Chapter 3.1: Casualty investigation process and methodology.

According to Syafiuddin (2016), a conflict of interest might exist if the maritime administration, as a regulatory body, is likely to conduct the casualty investigation. This is because the maritime administration may be related to the involved entities being investigated, which is an obstacle to their independence and objectivity as an investigative body (Syafiuddin, 2016).

Some states have adopted and maintained the principle of independence and objectivity by forming independent investigative bodies in their governments, as Poland and Indonesia have done.

In this aspect, there are no conflicts of interest within the investigating body in Poland. The Parliament of the EU obliges the Member States to establish an independent and impartial investigation body to conduct marine safety investigations, with the necessary powers and resources (EU, 2009). Poland, in 2013, complied with the directives of the EU as a Member State and established an independent body called “Państwowa Komisja Badania Wypadków Morskich” [the State Marine Accident Investigation Commission] (Łuczywek, 2017). Therefore, Poland provided a prominent example in making the responsible body to carry out a casualty investigation by forming a lasting and independent body, which consists of five members appointed for five years (Łuczywek, 2017).

This trend has also been applied in Indonesia since 1999, where an independent body separate from the maritime administration has been established to conduct casualty investigations, called KNKT [Komite Nasional Keselamatan Transportasi]. KNKT is under the responsibility of the MOT, but the Minister has no authority to intervene in its investigations (Syafiuddin, 2016).

In Jordan, as shown in Figure 7, the Accident Investigation and Marine Incidents Division reports to the Technical Affairs and Maritime Safety Directorate, which in turn reports to JMCs' Director-General and then the Minister of Transport (JMC, 2014). The Accident Investigation and Marine Incidents Division has no independent decision-making power but must seek permission or approval from the higher levels in the hierarchy.

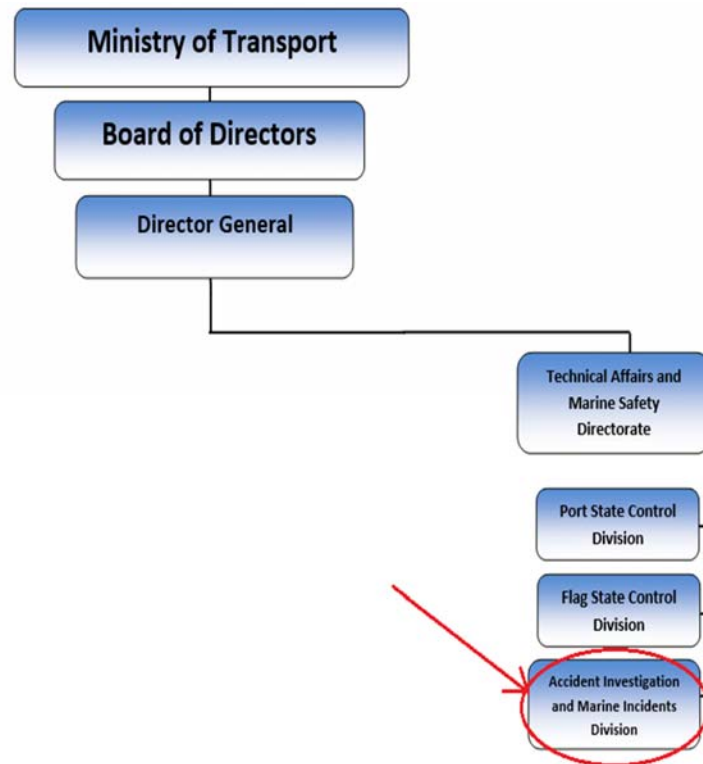


Figure 7: The investigation body hierarchy in JMC, part of the organizational chart

Source: (JMC, 2014)

IMO audit report 2016 also indicated that there was no evidence of independence or impartiality measures concerning investigators and investigations conducted by JMC (IMO, 2016).

Roed-Larsen and Stoops' (2011) study have shown that institutional and administrative relationships between different entities may restrict the independence of the investigation. In addition, the study shows that this issue is found in modern investigations in various fields of transport, whether maritime or aviation or land or related to any various sectors.

In some rare cases, Even the State provided an independent body for the investigation. However, the States should be careful about how to ensure the impartiality for the investigators. It should be noted; this independence poses a major challenge in its continuity in maintaining the independence and the absence of any external influence affecting the integrity of the independence factor of these institutions (Roed-Larsen & Stoop, 2011). For instance, The National Transportation Safety Board (NTSB) in the US was established as an independent body under the Ministry of Transport (Forbes, 2011). However, some political appointments interests have influenced the selection of judges, which in turn, affected the objectivity and independence of this institution (Roed-Larsen & Stoop, 2011).

The question remains in this study, whether Jordan's investigation body should be independent or non-independent? It is highly recommended to make the Marine Accident and Incidents Investigation Division an independent body from JMC. Therefore, it is essential to provide impartiality and objectivity for the investigators to carry out the investigation process and contribute effectively to the real purpose of the marine casualty investigation process.

The IMSAS audit report recommended that JMC should undertake initial work to separate the investigation functions from JMC in order to demonstrate impartiality and independence in marine casualty investigations. To that end, JMC proposed the creation of a marine casualty investigation unit in the MOT (Abu Zeid, 2019). One can also say that the accident investigation division is still non-independent because the division is within the Technical and Safety Directorate (JMC, 2014).

4.3 Cooperation Casualty Investigation

Preliminary work on co-operation in the marine investigation was undertaken by IMO through Article 10.1 from Chapter 10 Co-operation of Casualty Investigation Code (2008). IMO recommended that to the extent practicable, all interested States shall cooperate in marine safety investigations (IMO, 2008).

The Gulf of Aqaba, as shown in Figure 8, has significant importance to four countries: Saudi Arabia, Jordan, Israel, and Egypt. The total coastline for the Gulf of Aqaba is 385 kilometers, and the boundary is divided roughly between the countries. Egypt has the longest coastline, with 200 km. Saudi Arabia's coastline is 150 km.; Jordan's is 25 Kilometers, and Israel's is only 10 km (Rumley & Minghi, 1991).

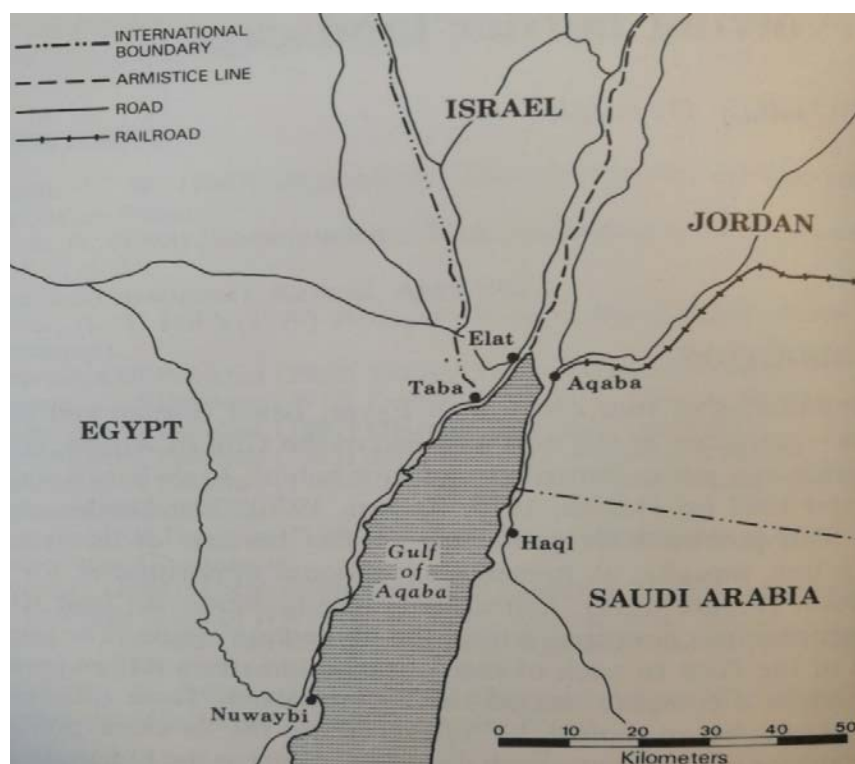


Figure 8: The Gulf of Aqaba region

Source: (Rumley & Minghi, 1991)

According to Rumley & Minghi (1991), Jordan is among the four countries most reliant on the Gulf of Aqaba since it is the only seaport to Jordan. The other outlets of Jordan are landlocked, and their route to the Mediterranean is only through the other countries, Lebanon, Syria and Israel (Rumley & Minghi, 1991). Despite, the political and economic conditions surrounding Jordan, Jordan has turned this single port into strength and used its tiny coastline as a lifeline by increasing its imports and exports and the prosperity of economic growth through the port of Aqaba (Rumley & Minghi, 1991).

It can be seen from Figure 8, showing the Gulf of Aqaba's border landscape, which any marine casualty that occurs outside the Jordanian territorial waters will be very close to the territorial waters of one of the other three countries. As such, the cooperation in marine casualty investigations will be an essential common opportunity for all these interested States to achieve maritime safety through establishing a regional marine accident investigation center in the Gulf of Aqaba (Salman, 2019).

To demonstrate the essential role of cooperation in investigation, after the Estonia disaster in 1994, the accident investigation system at the EU level revealed weaknesses in identifying and reporting the causes of marine accidents as well as a lack of cooperation between the maritime administrations of the EU Member States. Therefore, to ensure the harmonization of investigation procedures and methods, cooperation and uniform solutions were established among the EU Member States by creating legal standards for casualty investigations. The European Parliament and the Council adopted Directive 2009/18/EC on 23 April 2009 to establish the fundamental principles governing the investigation of accidents in the maritime transport sector (Primorac, 2018).

4.4 Summary and Conclusions

This Chapter addresses several contributing factors, which are stated in the provisions of the casualty investigation code. These factors are considered to be the essential reasons for the success or failure the investigation process and to the achievement of the main objective of the marine casualty investigation process itself.

These factors mentioned above are, first, primarily for marine investigators with respect for two major areas of qualifications and adequate training. The second pertains to the independence of the investigation body and whether it has sufficient powers to make the proper decisions related to conducting investigations or not, without the presence of any external influences from entities related to the investigation. The final factor is the extent of the role of cooperation in casualty investigations among States.

By comparison to the other states discussed above, in terms of impartiality, objectivity and independence measures in maritime investigations, there is still no evidence of a clear policy in Jordan to implement and enforce the standards of the Marine Casualty Investigation Code. Thus, there are no fundamental changes between Jordan before the IMSAS audit and Jordan after the IMSAS audit. At this point, Jordan still faces challenges to improve its performance.

In Jordan, despite the endeavors exerted in fulfilling its international obligations, there have been some disruptions in the attempts to implement the provisions of the casualty investigation code. For instance, despite granting their investigators judicial police power. However, due to some governmental decisions, there are insufficient financial resources to facilitate marine investigations. On the other hand, Jordan has strong points. This can be seen clearly in the first factor, the maritime qualifications and training of investigators. Additionally, Jordan has an opportunity to exploit its geographical location in the Gulf of Aqaba, shared with three other coastal States.

5. Chapter 5 Analysis and Findings

Jordan faces several challenges, such as fluctuation in its external and internal conditions and context. This study seeks to provide answers to these challenges. Therefore, a content analysis of the strengths (S), weaknesses (W), opportunities (O) and threats (T) (SWOT) analysis have been carried out to determine whether Jordan is implementing the Casualty Investigation Code and meeting its obligations to the fullest extent. The analysis is summarized in the SWOT Matrix (Table 1) below.

Strengths

Which factors support the implementation of the Casualty Investigation Code in Jordan. What are the existing advantages?

1. Ratification of all the relevant international maritime conventions, codes, and protocols.

After reviewing the institutional and legal framework, and the international instruments that have been ratified by Jordan, it can be concluded that Jordan has acceded to all the international maritime instruments related to marine casualty investigations.

2. Provision adequate specialized training

Effective training in respect of the responsibilities and modern investigative methods pertaining to the Casualty Investigation Code was observed. Therefore, qualified, proficient, competent and experienced investigators are provided by JMC. JMC provides investigators with adequate specialized training to investigate based on scientific methods.

Weaknesses

What could be improved? What is not done properly? What should be avoided? What obstacles prevent progress? Which elements need to be strengthened?

1. Lack of meeting the national requirements in the marine casualty investigation instructions.

JMC, as a governmental body, plays the legislator, regulator and supervisor of the maritime sector. At this point, the issuance of the local maritime legislation is extremely important in enforcing the relevant international instruments signed by Jordan.

In addition, the national bodies in the maritime sector in Jordan, considered as JMC stakeholders, are not required to read the international instruments. Thus, these national entities will be looking for the Jordanian national legislation issued by JMC that governs the investigation of marine casualties, which is expected to deal with and regulate the current situation in Jordan.

This finding has important implications for changing the marine casualty instructions from Instruction 2007 to the new Instruction 2017. For instance, there is a lack of a specific provision defining the purposes of carrying out a marine casualty investigation in the national legislation in Jordan.

2. Lack of specific and clear investigation methodologies.

Neither the Instructions 2017 nor the JMC Process Manual 2018 mentions that the marine casualty investigation process in Jordan is based on any scientific models or systematic methods that should be used for the investigation of marine casualties. In fact, the investigators in Jordan have sufficient training and they had the maritime knowledge in the casualty investigations, the knowledge is identified in this case implicit knowledge. However, JMC should consider this knowledge, and training should be documented in the instructions nor the process manual according to ISO standards to become an explicit knowledge.

3. The investigation division is a non-independent body.

According to Abuelenin (2017), the requirement for an effective marine casualty investigation is to ensure effective marine safety investigation and to support the independence of all parties involved in the investigation. Therefore, the investigation shall be carried out by another administration (Abuelenin, 2017).

Despite the recommendation of the IMO audit report 2016 and the initial effort made by JMC on 24 December 2018 as a corrective action by suggesting the separation of investigation duties, the JMC still has a non-independent marine casualty investigation body.

Opportunities

Where are the chances to enhance the current practice? What benefit can occur?

1. Regional harmonization

Jordan is located on a cargo transit corridor; the Aqaba port is a gateway for the transit goods to neighboring countries. Moreover, it is considered as a major center for Jordanian maritime trade in exports and imports. Therefore, the investigation of marine

casualty accidents and the development of policies to reduce incidents and accidents in the Jordanian territorial water is an important factor to ensure maritime safety.

The main challenge pertaining to international casualty investigations in the Gulf of Aqaba is the need for international harmonization under conditions of common approaches in order to comply with quality and credibility standards.

All States that share the Gulf of Aqaba are members of IMO, and all of them are supposed to implement their international instrument obligations in respect of marine casualty investigations. This is an opportunity for Jordan to initiate bilateral agreements with each State in the Gulf of Aqaba, establish a regional center for marine casualty investigation, and efficiently and effectively respond to any maritime casualty, accident or incident.

Threats

What obstacles are found in the current implementation of the Casualty Investigation Code in Jordan?

The current practice is subjected to considerable threats that restrict the full implementation of the Casualty Investigation Code, such as poor implementation or misdirected practices.

1. Insufficient financial allocations

The Jordanian government's policy decisions such as reducing financial expenditures lead to fluctuations in JMCs' budget. Insufficient financial allocation hinders the investigation process. In addition, this will lead to a failure to provide adequate financial allocations to implement the Casualty Investigation Code and affect the employment policy for the recruitment of highly qualified investigators.

2. Shortage in effective implementation of international codes

Abuelenin (2017), based on two case studies on improving special measures for marine accident investigation procedures, indicated that the reason for the insufficient maritime accident investigation is the shortage in applying international regulations related to maritime safety, and a lack of legal measures (Abuelenin, 2017).

A marine casualty investigation based on scientific and systematic methods will structure the investigation process and enhance the identification of causes, drafting the report based on the integrity of findings and the validity of recommendations (Roed-Larsen & Stoop, 2011).

Table 1 SWOT Analysis

Strengths	Opportunities
<ul style="list-style-type: none">- Ratify all the international maritime conventions, codes, protocols.- Provide adequate specialized training.	<ul style="list-style-type: none">- Regional harmonization.
Weaknesses	Threats
<ul style="list-style-type: none">- Lack of meeting the national requirements in the marine casualty investigation instructions.- Lack of specific and clear investigation methodologies.- The investigation division is a Non-independent body.	<ul style="list-style-type: none">- Insufficient financial allocations.- Shortage in effective implementation of international codes.

6. Chapter 6 Recommendations

The aim of this dissertation is to expose inadequacies in the current implementation of international and national casualty investigation legislation in Jordan. It was observed through the review of law, regulations and instructions of various States that the States differ in the way they implement their international obligations in relation to the provisions of the Casualty Investigation Code. Moreover, it has been observed that the power and the extent of the authorization in the implementation of some of these regulations come from the accurate statement of the provisions of the Casualty Investigation Code in their national regulations. In other words, Jordan should set out detailed national regulations that give an accurate reading of the state's understanding of the provisions of the Casualty Investigation Code.

The efforts made by Jordan to adopt the Marine Casualty Investigation Code to enhance marine safety standards might not be enough to the extent that the country needs to further effectively and adequately implement the international instrument. The IMO IMSAS audit of 2016 reveals that there is still significant room for improvement.

In particular, and in order to ensure the objectivity and impartiality of casualty investigations, Jordan should respect the independence and impartiality of investigators. JMC should strive hard to ensure an independent body to conduct marine casualty investigations. Such a status of independence should be measured against legal,

financial, organizational and sufficient resource indicators. Thus, this challenge of independence entails another challenge, which is to ensure the continuity of this independence without any political influence or consideration.

Systematic and organized training and competence development have mainly been the responsibility of JMC. Jordan has shown full interest in investigator training. Another challenge facing Jordan is the development and implementation of basic, coordinated and high-level training courses for investigators. Moreover, an important factor is the ability to identify training needs and to utilize training programs from competent international institutions in maritime safety. Transforming implicit expert knowledge into explicit knowledge happens by disseminating the training and knowledge provided to the investigators

Jordan must strive to be the first to initiate a regional center for the marine casualty investigations in the Gulf of Aqaba; consequently, there will be a significant opportunity for the exchange of experience among the marine investigators of all the States. Regional cooperation at an efficient and effective level will enhance maritime safety in the Gulf of Aqaba.

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APPENDICES

Appendix 1 Finding-4

CORRECTIVE ACTION			
Member State:	Jordan	Audit Period:	14-23 October 2016
Department:	JMC	Team leader:	<u>Mourad Ghorbel</u>
Finding No.:	FD-4	Observation No.:	

Root Cause:

JMC's Quality Management System manual does not contain a comprehensive policy in place to assist the State in the implementation and enforcement of national legislation, rules and regulations to give full and complete effect to the provisions of applicable mandatory instruments to which the State is a Party.

Corrective Action:

JMC Quality Management System (QMS) will be developed to integrate comprehensive policy where processes, Procedures, guidelines, standard check lists and other performance indicator evaluation tools will be established and incorporate into (QMS) to define and assign responsibilities, set evaluation standards, methodologies, to give full and complete effect to the provisions of applicable mandatory instruments to which the State is a Party.

Proposed target completion date: 31-12-2018

Action Plan Submitted:

By Nedhal Abu Zaid On

To: Audit Team Leader: <u>Mourad Ghorbel</u> <div style="text-align: center;">Name</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div>	IMO Secretariat: <div style="text-align: center;">Name</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div>
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<input type="checkbox"/> For Review: <div style="text-align: center;">Signature</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div> <div style="text-align: center;">Date</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div>	<input type="checkbox"/> For Information: <div style="text-align: center;">Signature</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div> <div style="text-align: center;">Date</div> <div style="background-color: #cccccc; width: 20px; height: 15px; margin: 0 auto;"></div>
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Appendix 2 Finding - 8

CORRECTIVE ACTION			
Member State:	Jordan	Audit Period:	14-23 October 2016
Department:	JMC	Team leader:	<u>Mourad Ghorbel</u>
Finding No.:	FD-8	Observation No.:	

Root Cause:

The existing legislative provisions of the marine casualty investigations promulgated in accordance with a revoked resolution A.849 (20) until IMSAS preparation process. The state did not adopt limitation for independence and impartiality for the investigators, where port state officers and flag state officers used to participate in marine investigations. The obligations that investigation reports should be communicate to the IMO through GISIS and published to public were unknown.

Corrective Action:

Jordan Maritime Commission as the only part responsible for marine casualty investigation will adopt resolution MSC.255 (84), resolution A.1075 (28) when promulgating the regulations of Marine Safety Investigation and Marine Causalities and Incidents. JMC will establish a procedures and policies address related issues. The Impartiality and independence of casualty investigations will be ensured by exclusive accident investigators well trained ready availability of expertise for different investigations issues will be addressed with adequate resources and logistics, recommendations after accomplished investigation report will be duly disseminated to the public and communicated to IMO by loaded in GSIS and periodically evaluation will be done as the requirements of III code.

Proposed target completion date: 01-07-2017

Action Plan Submitted:

By Nedhal Abu Zaied On

<p>To: Audit Team <u>Mourad Ghorbel</u></p> <p>Leader: </p> <p style="text-align: center;">Name</p> <p><input type="checkbox"/> For Review: </p> <p style="text-align: center;">Signature Date </p>	<p>IMO Secretariat: </p> <p style="text-align: center;">Name</p> <p><input type="checkbox"/> For Information: </p> <p style="text-align: center;">Signature Date </p>
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Copies to: